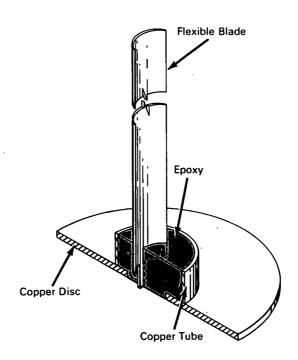


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Astronaut Space Suit Communication Antenna



In carrying out his investigations on the moon surface, the astronaut must maintain communication with the Lunar Excursion Module (LEM) as he moves about. He must also have unencumbered use of his hands. For these reasons, an investigation has been made of communication antenna design for mounting on the astronaut's backpack.

One design consists of a dual frequency transmission line mounted in a foam filled fiberglass cavity. Tests of this antenna resulted in worst case null depths from -19 to -30 db for normal backpack heights, thus reducing the maximum useful range for astronaut-to-LEM to less than 400 yards.

A second design, consisting of a spring steel monopole in a blade-type configuration, has shown superior performance characteristics. This antenna is mounted in a copper cup filled with a potting compound that is recessed in the center to facilitate bending the blade flat for stowing when not in use. Tests of this antenna resulted in worst case null depths from -5 to -11 db, amounting to an appreciable gain in maximum useful range of astronaut-to-LEM. This antenna exhibits an unusually broad bandwidth characteristic over the LEM operating frequency range of 259.7 MHz to 296.8 MHz with a voltage standing wave ratio of 1.6:1 or less.

(continued overleaf)

This document was prepared under the sponsorship of the National Aeronautics and Space Administration. Neither the United States Government nor any person acting on behalf of the United States Government assumes any liability resulting from the use of the information contained in this document, or warrants that such use will be free from privately owned rights.

Notes:

- 1. The wide bandwidth, not normally associated with monopole antennas, is mainly due to the relatively large mounting cup diameter of 1-1/8 inches and the favorable impedance characteristic, achieved by using the backpack hard cover and the thermal garment for a ground plane. The monopole antenna operates as an asymmetric dipole because of the irregular ground plane with a characteristic impedance between the 36-ohm monopole and the 72-ohm dipole, represented by the coax lead.
- 2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer Manned Spacecraft Center Houston, Texas 77058 Reference: B68-10238

Patent status:

No patent action is contemplated by NASA.

Source: Jefferson F. Lindsey, III

and Gareth H. Nason

(MSC-12101)



